



NIMA INTEGRATION TEST FACILITY

**Presented to
Test Process Oversight Committee**

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Purpose

Describe NIMA's improved methodology of delivering quality to the customer through the NIMA Integration Test Facility (ITF)



Overview

- **What is USIGS**
- **The Integration Test Facility**
- **NIMA's Commitment**
- **Meeting the Commitment**
- **ITF Processes**
- **Summary**



What is USIGS?

➤ Simplest form:

- * The **network of systems** used by the Department of Defense (DoD) and the Intelligence Community that share and exploit imagery, imagery intelligence, and geospatial information.
- * In concert with the C4ISR Framework to ensure interoperability with other organization's operational, systems, data, and technical architectures
- * These systems provide capabilities involved with the integrated management, collection, production, exploitation, dissemination and archive, and infrastructure of this information.

➤ Current state:

- * A large number of existing, disparate systems that performing tasking, exploitation, dissemination and/or storage of imagery or information.

➤ Target state:

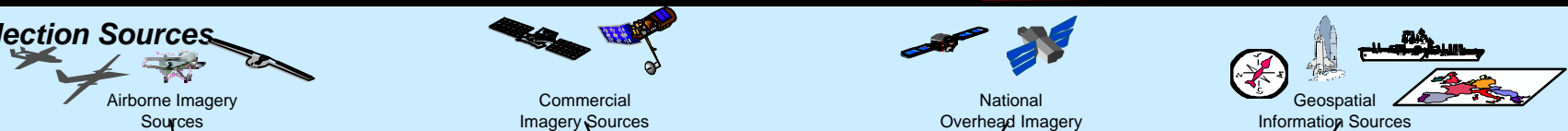
- * As defined in the USIGS Objective System Architecture for period FY00 thru FY05, subject to cost and schedule constraints

"An open, shared, web-like information exchange environment supporting the Imagery and Geospatial Community (IGC)"



USIGS System Architecture

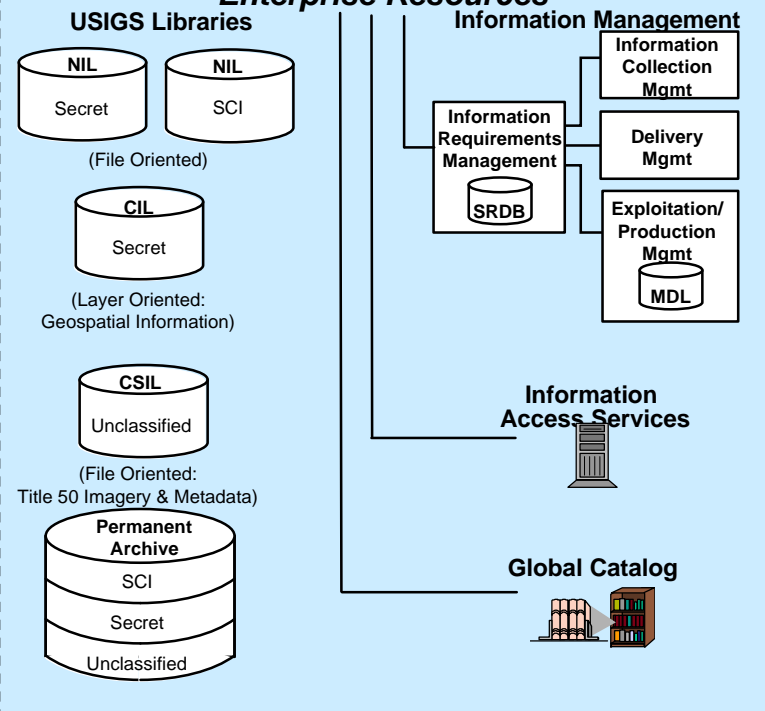
Collection Sources



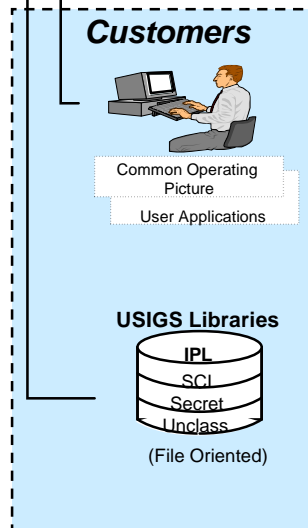
Communications Infrastructure



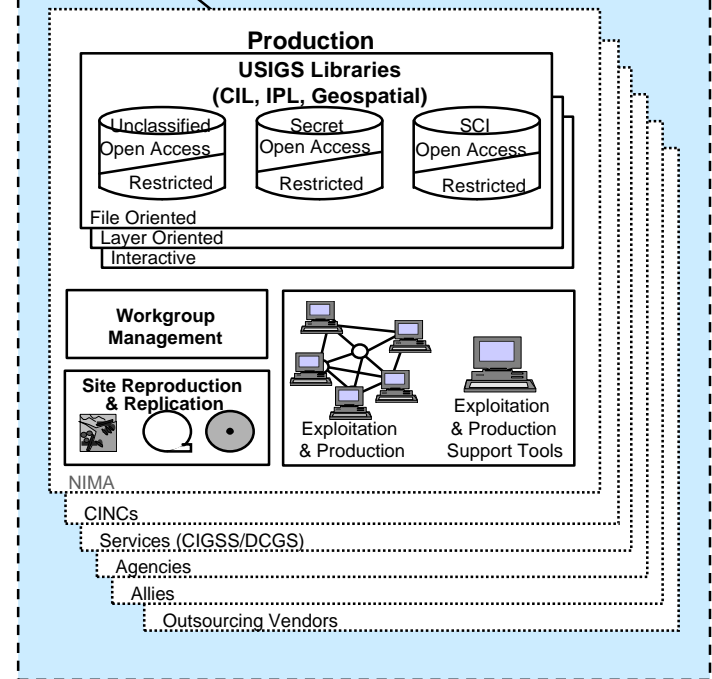
Enterprise Resources



Customers



Production Centers



Acquisition & Technology



Integration Test Facility

➤ Charter

- ✱ To manage and support the execution of NIMA's transition to United States Imagery and Geospatial Information Services (USIGS) Architecture

➤ Purpose

- ✱ Determine the operational suitability and the operational effectiveness of NIMA-USIGS segments
- ✱ Define the configuration baseline of the approved NIMA-USIGS segments

Independent system-wide testing emulating operational conditions



Mission, Vision, and Goals

➤ Mission

- ★ Assure the **quality and readiness** of systems delivered to operations by NIMA acquisition organizations through verification, readiness, and test activities

➤ Vision

- ★ This vision of the ITF is to become a **world-class verification facility**, recognized as an advocate by NIMA's customers and acquisition organizations and as the model to emulate by other verification organizations



Mission, Vision, and Goals

➤ Programmatic Goals

- * Identify and report USIGS integration and verification issues as early in their development cycle as possible, as evidenced by active participation in technical exchange meetings and reviews of USIGS technical and programmatic information
- * Involve NIMA's customers and acquisition organizations early and throughout the verification process in planning, execution, and reporting activities
- * Ensure that the configuration of the USIGS operational baseline is always controlled
- * Ensure image and data quality standards are achieved and can be maintained over the life of the system



Mission, Vision, and Goals

➤ Testing Goals

- * Verify functional and performance requirements based on customer's operational environment
- * Ensure all verification activities produce accurate and repeatable results
- * Ensure USIGS capabilities are delivered into the operational baseline with minimal defects
- * Track and report defects in USIGS capabilities through Discrepancy Reports
- * Ensure that the USIGS operational baseline can be recreated at any point in the USIGS lifecycle
- * Manage the schedule and resources to ensure rapid and flexible resolution of problems with minimal impact to all customers





Mission, Vision, and Goals

➤ Business Goals

- * Reduce the USIGS verification activity timeline for each USIGS development cycle while still meeting the other goals through process improvement efforts and reuse of information, test procedures, and test results
- * Serve as a consolidated geospatial and imagery test facility for NIMA
- * Serve as a consolidated Beta I test facility for the DoDIIS and imagery community
- * Serve as an “honest broker” between the developer, the acquisition office, and the customer to ensure that NIMA deploys systems that answer the “Critical Operational Issue” question.
 - Can the system perform its mission in its operational environment?





NIMA's Commitment

- **Provide technical integrity in delivered capabilities**
- **Thoroughly test and de-bug BEFORE delivery**
- **Involve the customer in test planning and execution**
- **Support the customer after deployment**

Deliver quality products to all customers





Why?

Because it's the right thing to do





How??

(Part 1)

- **Rigorous, defined and repeatable processes**
 - * Guidance in-place
 - * Process improvements

- **Commensurate integrated testing environment**
 - * Hardware
 - * Software
 - * Infrastructure
 - * Capacity





Process Improvement Initiative

- **Focused on systems engineering, software engineering, and software acquisition**
- **Includes System Integration, Test and Evaluation**
- **Process Action Team established to define, document, implement, and institutionalize integrated system test and evaluation**
 - ✳ Build off of existing guidance and plans





Documents in Development

- **System Test and Evaluation Process- Process Action Team**
- **Transition and Integration Guidebooks**
 - ✱ Processes distributed throughout ATS; ATSI responsible for Integration, Readiness and Test
- **Capstone USIGS Test and Evaluation Master Plan (TEMP) - ATSI**
- **Capstone USIGS Training Plan - ATSS**
- **Capstone Logistics Plan - ATSS**
- **Capstone Security Plan - ATSE**
- **ITF Baseline Control Plan - ATSI**
- **ITF CONOPS - ATSI**





ITF Processes

- **Transition & Integration Guidebook is the cornerstone**
 - * Contains specific transition requirements/activities that a development is to perform
 - * Utilizes DoDD 5000 and NIMA PID are the 'Frames of Reference' detailing specific transition & integration activities within the acquisition life-cycle
 - * Processes are tailorable, scalable, and repeatable and can be applied to a single segment or a multiple segment transition by transition or segment staff
- **Processes are documented in two separate volumes:**
 - * SOST-STD-0001 Transition & Integration Volume 1 (Contract)
 - * SOST-STD-0002 Transition & Integration Volume 2 (Implementation/Methods)





ITF Processes

➤ **SOST-STD-0001 Transition & Integration Volume 1 (Contract)**

- ✱ The generic contract (or binding agreement) between the developing organizations and the ITF on integration requirements/activities that are necessary.
- ✱ Identifies the “handoff” requirements
- ✱ Identifies the integration and test activities that must be initially addressed during pre-planning of a project effort
- ✱ ITF requirements/activities are categorized and presented in terms of the acquisition life-cycle periods including:
 - Integration Validation
 - Test & Evaluation
 - Security
 - Functionality
 - Performance





ITF Processes

➤ **SOST-STD-0002 Transition & Integration Volume 2 (Implementation/Methods)**

- * Represents the encapsulated implementation specifics not visible to developing organizations
- * Defines all processes (both phase-dependent and phase-independent) necessary to effectively perform project-specific transition activities
- * Processes defined using ETVX (Entry-Task-Verification-Exit) paradigm
- * Volume 2 documents the following internal process mechanics:
 - Detailed Process Definitions: using ETVX
 - Generic WBS: to track resources applied against all activities
 - Management Decision Framework: to evaluate all integration and test activities across all USIGS Projects





How??

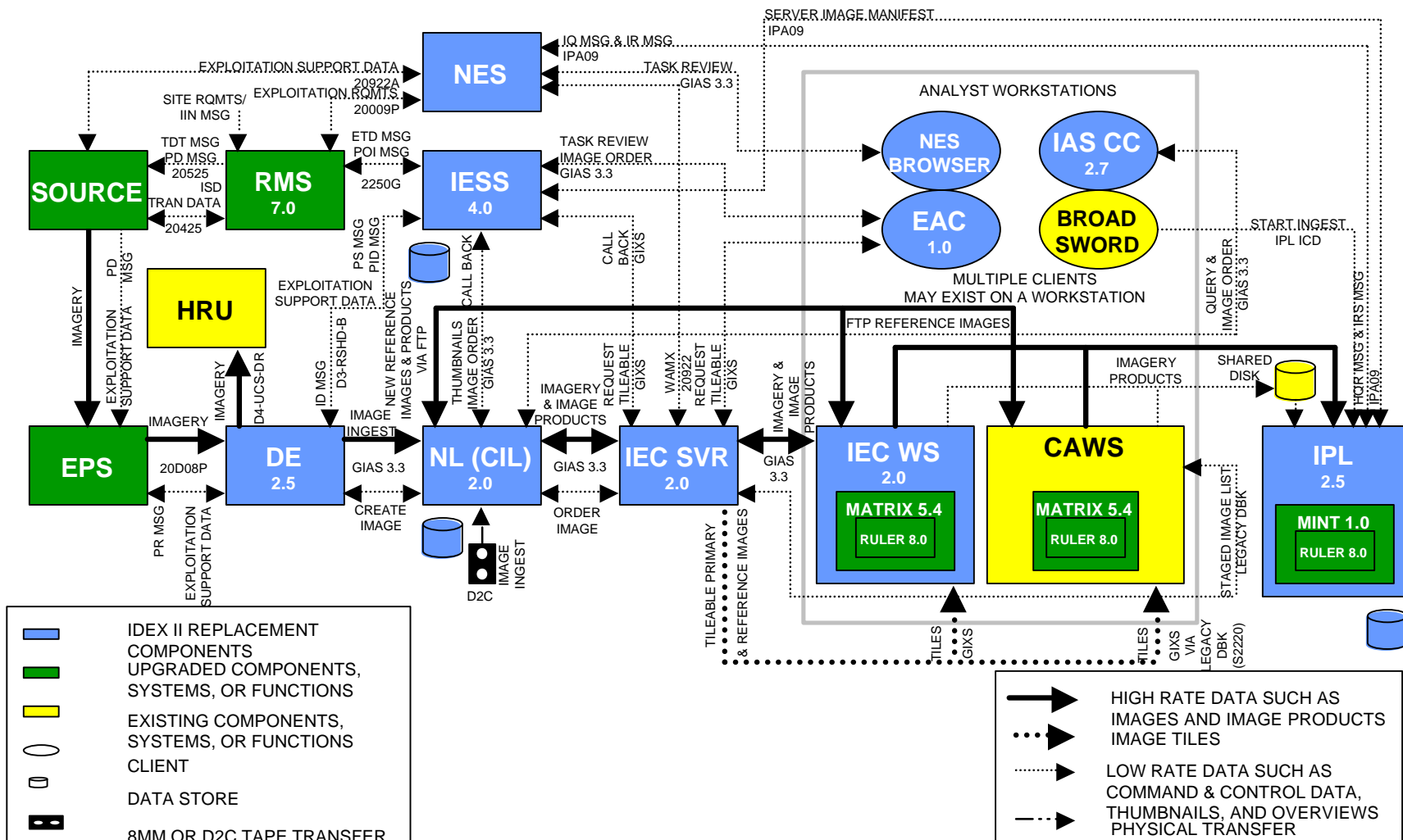
(Part 2)

- **Improved ITF robustness**
- **Testing ALL capabilities before delivery**
- **Supporting capabilities post-delivery**
- **Maintaining the “Gold Copies”**





IDEX II Replacement Imagery Flows



(A Portion of USIGS)



The ITF role in USIGS

➤ **Eliminates Multiple Approaches to Testing and Evaluation**

- * Legacy components and planned NIMA systems acquisitions were created using varied and widely different system development life cycles and test and evaluation processes. As such, there was no one T&E approach and process model used. A need existed to standardize the way NIMA planned and implemented T&E.

➤ **Standardized Approach**

- * The processes documented in the DODD 5000.2-R and DoDIIS Instructions will be used in all NIMA system acquisition programs. Testing processes captured in NIMA Capstone TEMP







ITF Support to the PMs

- **Support the development and execution of segment test scripts for test scenarios and from these, compile checklist items for test plans**
- **Write and execute system integration test plans and compile checklist items for test plans**
- **Troubleshoot segment and interoperability related problems**
- **Operate segment during installation, checkout and test/demo activities**
- **Serve as segment POC at ITF daily meetings that address schedules, test activities, and integration issues**
- **Support technical exchange meetings to include overview briefings, informal training, etc.**
- **Assess ITF “Requests for Services”**
- **Support segment training of ITF personnel at ITF facilities**
- **Provide operational support for informal test activities prior to formal tests**





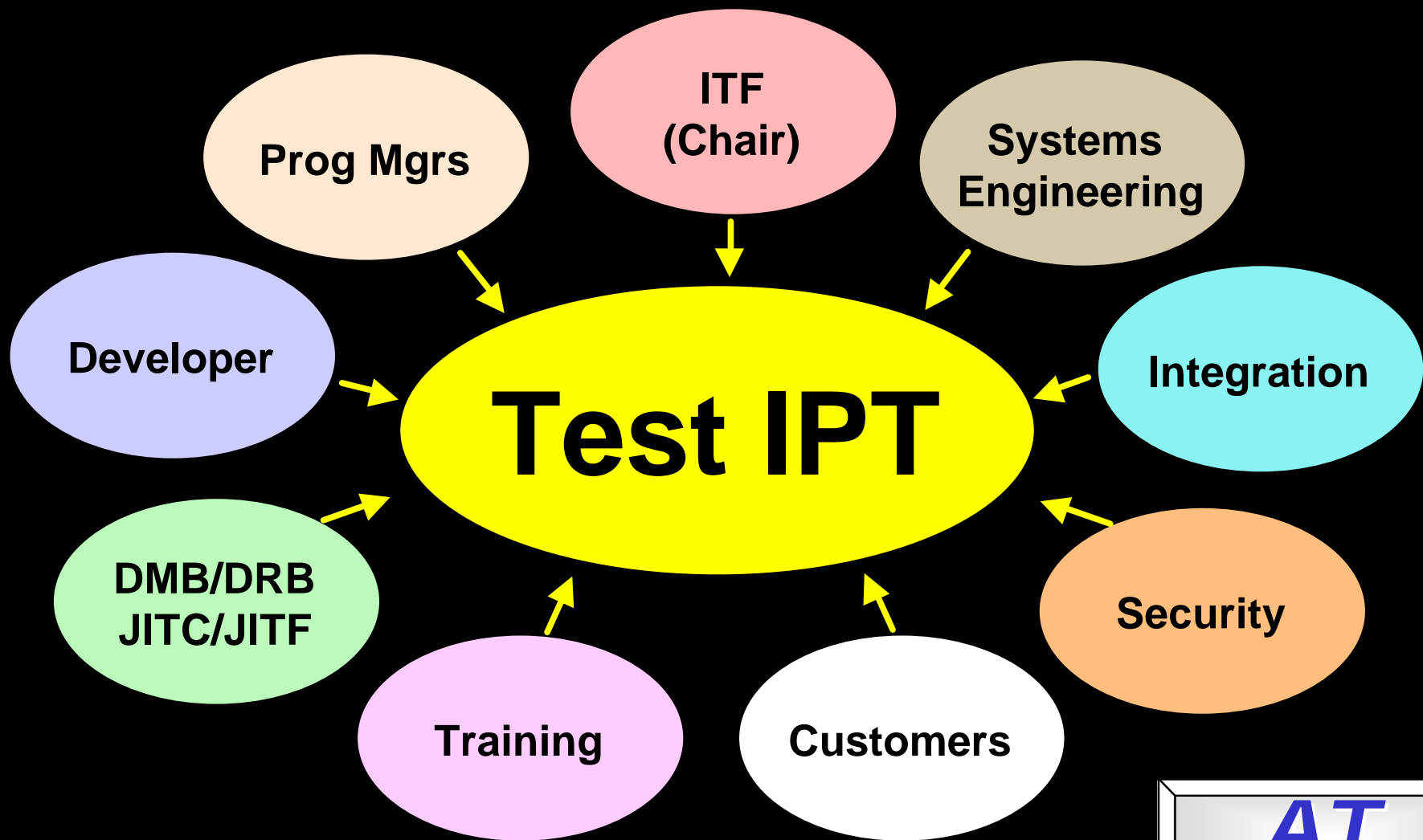
ITF Support to the PMs

- Operate segment hardware and software
- Perform manual operations such as manual overrides, etc., as necessary
- 8x5 operations with 20% reserves for additional overtime and shift differential
- Install and verify segment hardware
- Install segment software, create and populate databases, and monitor and verify integrity of systems
- Modify segment settings and make any necessary h/w and s/w changes
- Provide support for
 - * Segment hardware
 - * Segment connectivity
 - * Systems engineering
 - * Segment database administration
 - * Segment test tools





Test Integrated Program Team





ITF Locations

- **Newington, VA**
 - * USIGS
- **Washington Navy Yard**
 - * Internal Imagery Analysis systems
 - * CIA-networked systems
- **Bethesda/Reston**
 - * Geospatial production systems
- **St. Louis**
 - * NIMA Corporate Applications





One Critical Operational Issue

➤ **Can the system perform its mission in its operational environment? Test and evaluation must address the following:**

✱ **Performance and Functionality**

➤ Does the USIGS performance and functionality meet operational mission requirements in steady state and during surge/crisis operations?

✱ **Compatibility, Integration, and Interoperability (CII)**

➤ Does the USIGS meet the CII requirements to effectively interact with operational baseline systems?

✱ **Vulnerability and Survivability**

➤ Does the USIGS provide the security to withstand AIS network assaults and can survive manmade and natural calamities and disasters?

✱ **Suitability**

➤ Is the USIGS usable in the operational environment to meet operational demands?

✱ **RM&A**

➤ Does USIGS meet the reliability, maintainability, and availability mission requirements?





Summary

- **Strong commitment to delivering and responsive quality product**
- **Improved processes and a robust ITF are essential**
- **Integrated customer involvement is critical**





Back-up Slides



What Has The ITF Done Lately?

Newington

NIMA-Centric Y2K

Command Y2K

Y2K IV&V Evaluation

SVR-31 - EXX

IRP Integration Tests 13, 14, 15, 16, 17 and 18

Demo F14 - IRP

IRP Regression Testing

Demo 44 - EXX

IDEX/Win2K Workstation Evaluation

DE 2.5 Beta I Test





What Has The ITF Done Lately?

St. Louis

Supported NIMA-Centric Y2K

Built NT server baselines for SBU and SCEN Test Networks (Nov 99-Feb 00)

Built initial ITF test baseline for the SBU and SCEN NIMA networks (Nov /Dec 1999)

Integration testing all COTS desktop applications defined for 99-03 baseline (Approximately 20 applications)

Completed integration and testing of 99-04 baseline build (January 2000)

Completed integration and testing of 00-01 baseline build (April 2000)

Support Help Desk Development - Peregrine





What Has The ITF Done Lately?

St. Louis (Continued)

Corporate Applications

Imagery & Mapping Investment Strategy (IMIS) - POM development software for NIMA

Computer Automated Facilities Management (CAFM) - Critical facility management system for MS

Purchase Card 4.0 - New credit card database software for NIMA wide application

USIGS Support

UGPM Support - UGPM Window 2 test planning for St. Louis

MapInfo 5.0& FoxPro - UGPM Contingency plans for Y2K (Tested on SCEN)

Front End Processing Environment (FPE) - System to System

Interface testing in St. Louis

DPDW - Interface testing between IEC and DPDW

DPDW2 - Testing DPDW system connectivity to SCEN





What Has The ITF Done Lately?

WNY

NIMA-Centric Y2K Testing for SON/SOC

IPL 2.0 and 2.1 testing, (FAT) and (SAT)

Peregrine Service Center

SCI Consolidation Application Testing

FrameMaker, Arcturus; Oilstock; Ruler

Support St. Louis

Ongoing testing of SOC SBU and SCEN Baseline

Completed testing of MAC/AEN, SBU NT

Completed Customer Guide and CONOPS documentation





What Has The ITF Done Lately?

WNY (Continued)

- Built and configured the following Servers for the WNY ITF:
SCEN, Blue, Aqua, Mercury Scripts and Tools, Lotus Notes, File, Jumpstart
- Participated in IRP Demo F14 in Newington (April 10-April 21) as Data Recorders for the Imagery Analysts
- Support Newington site in NOC-I workstation testing





What Has The ITF Done Lately?

Reston/Bethesda

UGPM -

Two government and 0.5 contractor working full-time for the past year

Numerous TEMPs, use-case scenarios, thread tests, etc. developed
(Whenever one was completed, the program would change direction)

Tests conducted in IDME

- SVT #1 9/13/99-10/8/99 Failed
- SVT Release #1 (Limited) May 2000

MCGIF - TEMP in work

PlanCon2000 March 2000 Success





Resident ITF - Newington Systems

- **Dissemination Element (DE)**
 - NIMA Library (NL)**
 - Integrated Exploitation Capability (IEC)**
- **Imagery Exploitation Support System/Enhanced Analyst Client (IESS/EAC)**
- **Information Access Service/Common Client (IAS/CC)**
- **Imagery Product Library (IPL)**
 - Imagery Data Exploitation II (IDEX II)**
- **Demand Driven Direct Digital Dissemination Server (5D)**
 - Requirements Management System (RMS Connectivity) - Requires JWICS (See comms slide)**
 - National Exploitation System (NES Connectivity) - Aug 00**





Newington Communications Capability

Unclassified (Campus System with Internet Access)
SBU (Sensitive but Unclassified, with Internet Access)
SCEN (Secret Collateral Enterprise Network) - (Jun 00)
SIPRNET via SCEN - (Jun 00)
VTC (NIMA Enterprise) - (FY01)
VTC - JWICS (Campus System)
JWICS (TS/SI/TK, Intelink, Green) - (Aug 00)

ITF received informal (email) approval from DIA on 3/23/00 to connect the ITF LAN to NIMA JWICS - In Work

Fully integrated LAN between all NIMA-developed segments
DDS - Port 38 on EPS (Enhanced Process System)
TELECON (Clear and Secure)
RDSMS - Wide Band (Proposal in Work - FY00 TBD)





Classification & Connectivity

➤ Classifications

* WNY

➤ SCI/TK B, SCEN, SBU

* St Louis

➤ SBU, SCEN, Unclassified

* Newington

➤ SCI/TK B, SCEN, SBU, Unclassified

➤ WAN Connectivity

* WNY/Area

➤ NIMA Networks

* St Louis

➤ NIMA Networks

* Newington

➤ DS3 to NIMA Networks





Hardware and Software

➤ Hardware

- * WNY - SUN, DELL, IBM, Compaq
- * St Louis - IBM, SUN, Compaq
- * Newington - IBM, DEC, SUN, SGI, Dell, Compaq

➤ Software

- * WNY
 - Solaris, NT, NIMA applications ,C, C++, Java, Java Script, HTML, Netscape, Sybase, Sybase SQL
- * St Louis
 - The St. Louis ITF runs the same suite of server software currently running on the SBU and the SCEN.
- * Newington
 - C, C++, JAVA, JavaScript, HTML, Unix Shell Script, DEC C, StP, RTM, Rational Rose, PDI, Deft, PVCS, PreVue-X, Visibroker, JDK, Netscape, FrameMaker, Informix SQL

